



EIFFEL H2020 PROJECT: REVEALING THE ROLE OF GEOSS AS THE DEFAULT DIGITAL PORTAL FOR BUILDING CLIMATE CHANGE ADAPTATION & MITIGATION APPLICATIONS

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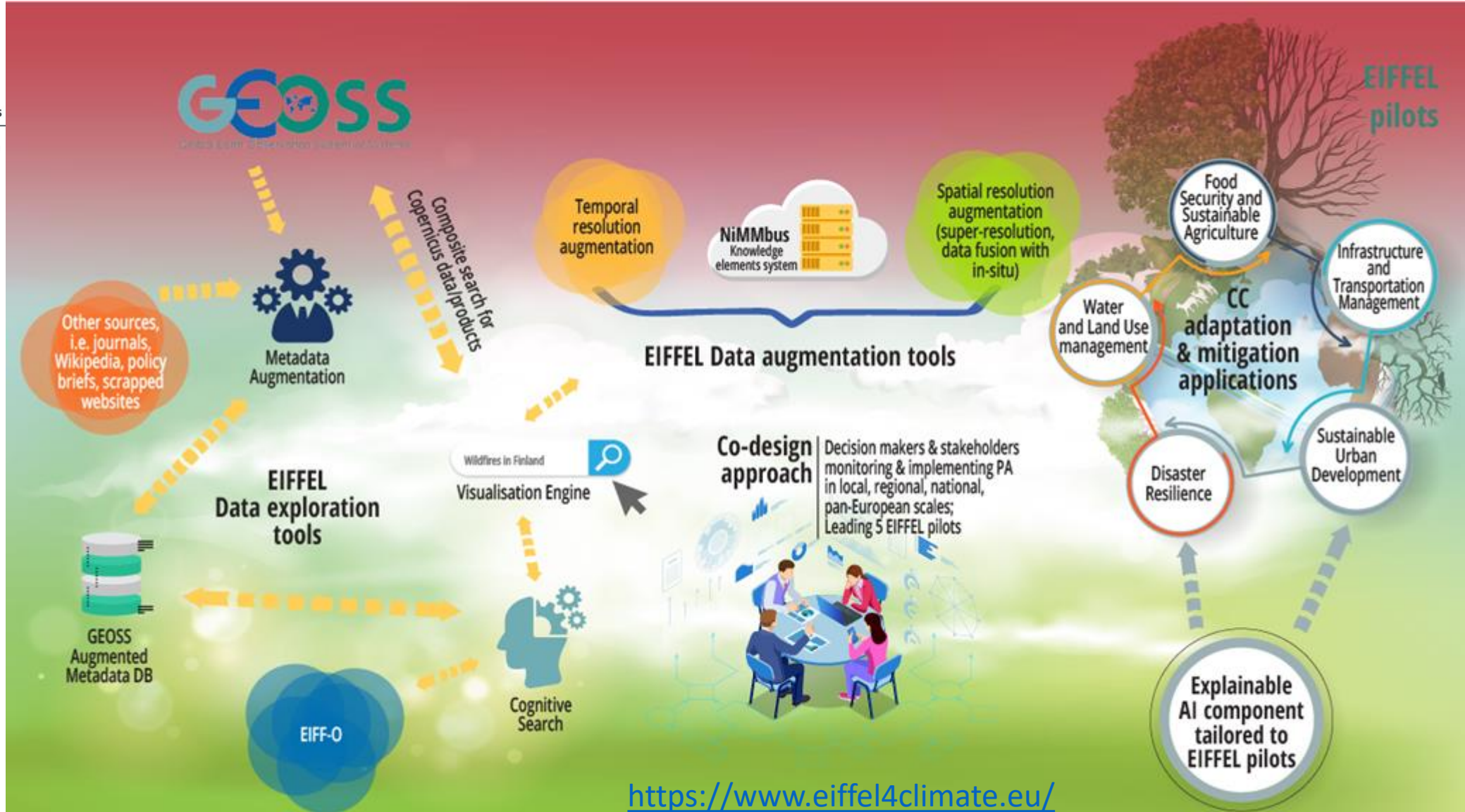


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Eleni Athanasopoulou is a post-doctoral scientific researcher at the National Observatory of Athens (Greece). Her expertise is atmospheric numerical modeling, which she uses to assess air pollution at the regional and local scales. During the last years, she deals with urban air pollution through the use of city-scale chemical transport modeling. She co-leads the Urban Resilience and Sustainable Urbanization Group of the [Greek Geo Office](#) since 2019.

In a nutshell



Challenges faced by the



- **Reduce urban GHG emissions from high-impact sectors (by > 30% by 2030 compared to 1990).**
- **Implementation of National and/or City Plans**
- **Cities lack the geo-referenced data and the tools for designing evidence-based city-scale policies**
- **Holistic approach in tackling CC mitigation and adaptation at the city level taking into account and combining different sectors**
- **Inefficient communication between competent institutions to tackle the above issues**



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Athens, the Greek capital, hosts a population of ~4million and ~40% GDP

Development of a Decision Support Application (DSA) to enable inspection of GHG mitigation scenarios, in three urban-critical sectors:

**Building energy efficiency,
photovoltaic penetration in urban environments,
vehicle fleet emissions +
intra-urban Air Quality**

Solutions is developing in the pilot



1. Photovoltaic penetration

Footprint of buildings and their main geometric features



Greek Land Registry

Potential areas for PV penetration



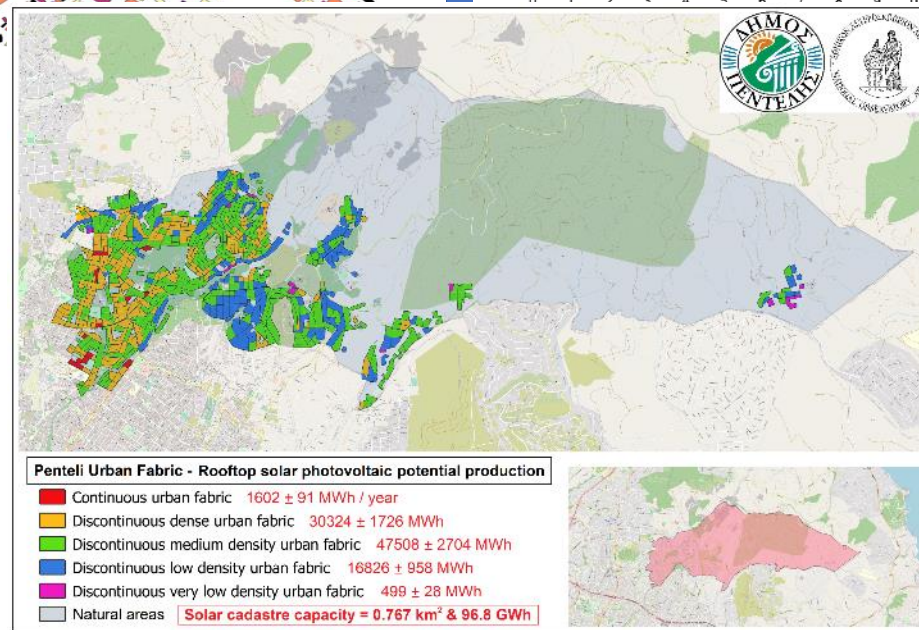
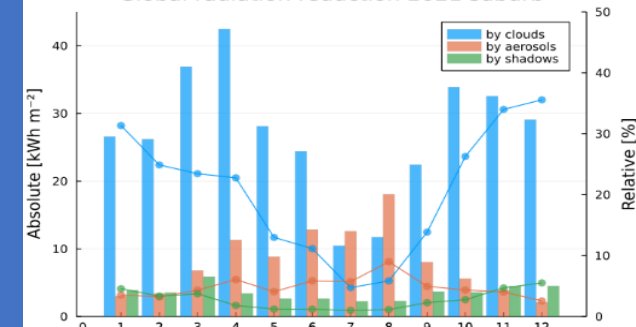
Inclination and orientation aspects and shadowing effects

Solar energy availability at building/neighborhood level



Atmospheric vs shadowing effects

Global radiation reduction 2021 suburb



Solutions is developing in the pilot



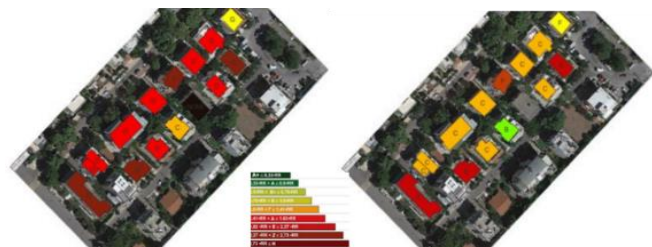
Eiffel
GEOSS APPLICATIONS
FOR CLIMATE CHANGE

2. Building energy efficiency

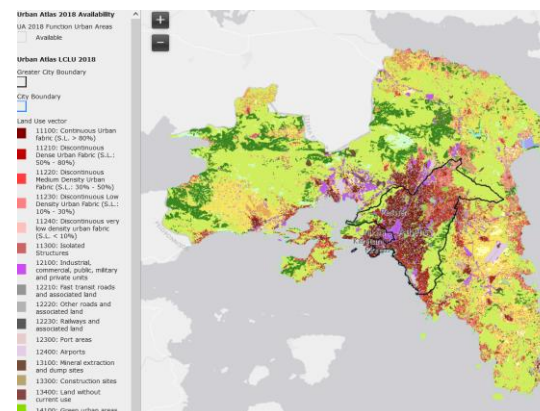
Building performance calculations for developing the **Energy Use Indicators (EUI) dataset** for residential buildings in the Municipality of Penteli using typical buildings from **the Hellenic TABULA database** are being performed and will continue with typical non-residential buildings.

Completed an analysis of published data from **Census 2011** to derive the **building distributions** according to type of use (residential, non-residential), size (single/multi family), age (pre1980, 1981-2010, post2011), type of heating and use of solar collectors for domestic hot water preparation.

As a proof of concept the methodology to be followed in the building efficiency application has been applied to a small neighborhood area (paper on the EIFFEL building stock analysis under preparation).



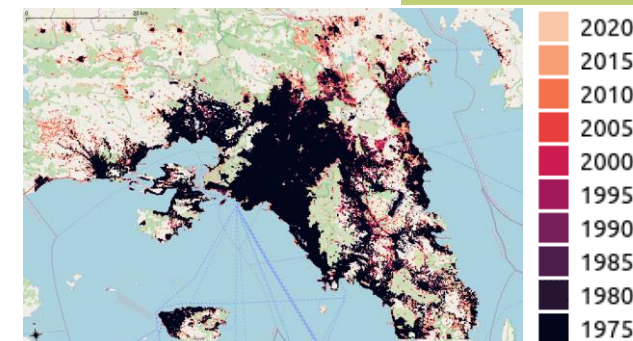
Urban Atlas
for use



Sentinel 2
NDVI



GHSL for
date of
construction



DSM and
Urban Atlas
for building
height

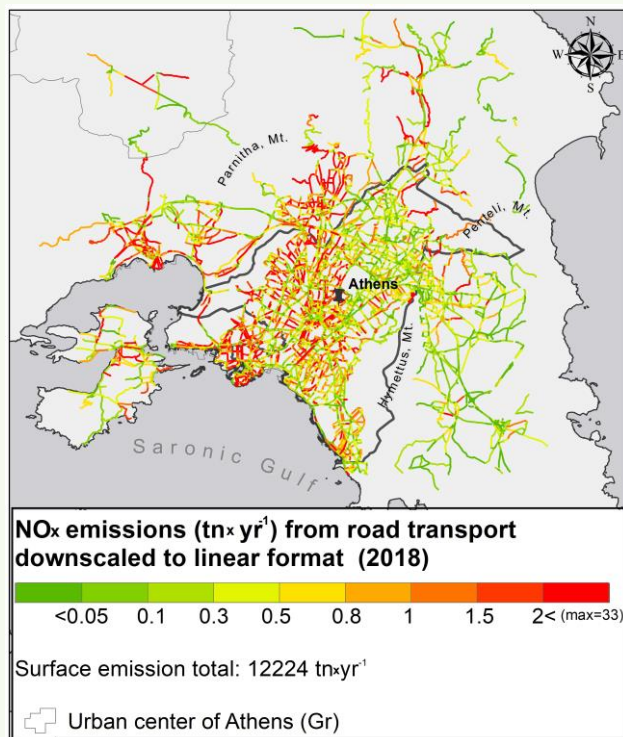


Solutions is developing in the pilot



3. Vehicle fleet emissions

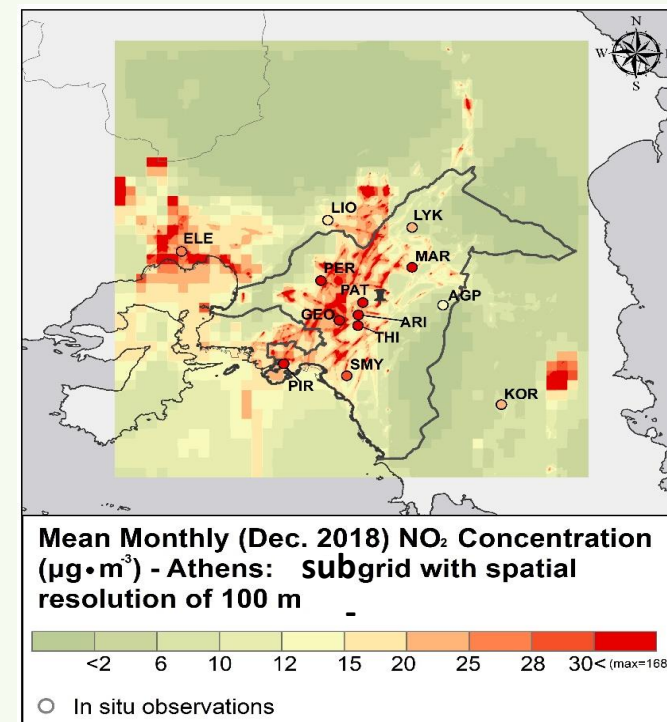
Calculations of vehicle emissions take into account the amount of fleet and the vehicle kilometers, environmental data and emission factors.



4. intra-urban Air Quality

Use city-scale modelling to translate GHG abatement scenarios in population exposure/health outcomes

Urban scale
CTM modeling
*Episode-
CityChem*





Thank You.
Medaase.
Oyiwaladon.

